REMARKS/ARGUMENTS

No amendments to the claims have been made with this response. To comply with the Examiner's requests, the specification has been amended to correct typographical errors and to recite support for terms in objected claims. No new matter has been added by way of these amendments to the specification. Upon entry of the present amendment, the pending claims will remain claims 123-138.

This amendment responds to the Office Action mailed on August 12, 2004. In the Office Action the Examiner:

- allowed claims 123–138;
- objected to the abstract for not describing claim 123; and
- requested Applicants' cooperation in correcting minor errors in specification;
- requested that Applicants provide copies of references cited on pages 1-6, 13, 15, 18, 20, 24, 26, 27, 30, 32, 36, 38, and 40 of the specification; and
- objected to the specification for failing provide proper antecedent basis for claims 123, 126, and 136.

APPLICANTS HAVE CORRECTED THE SPECIFICATION

The Examiner has requested Applicants' cooperation in determining the presence of possible minor errors in the specification. With this response, Applicants have made corrections to minor errors in the specification. Applicants have amended typographical errors in paragraphs beginning on pages 4, 12 (two instances), 19, 20, 24, 27, 28, 29, 31, and 42 of the specification. The amendments on pages 4, 12 (at line 14), 19, and 20 correct spelling errors. The amendments on pages 24, 27, 28, and 42 correct punctuation and grammar. The amendments on pages 29 and 31 correct typographical errors.

Applicants have amended the paragraph beginning at page 29, line 1, to reference "qubits 610." The reference replaced, "qubits 620," was a typographical error in the specification as originally filed. Applicants have amended the last sentence of the paragraph beginning at page 29, line 1, to recite "a resonant control system 620 (Fig. 6)". The recitation of "a resonant control system 620 (Fig. 7)" was a typographical error in the specification as filed. There is no reference symbol 620 in Figure 7.

The proposed amendments do not introduce new matter. Approval and entry of the amendments is respectfully requested. Withdrawal of the objection, in view of the amendments to the specification is respectfully requested.

APPLICANTS HAVE PROVIDED THE REQUESTED REFERENCES

The Examiner has requested that Applicants provide copies of the references cited on pages 1-6, 13, 15, 18, 20, 24, 26, 27, 30, 32, 36, 38, and 40 of the specification. Applicants have provided an information disclosure statement that includes a copy of the requested references. Withdrawal of the objection, in view of the provision of the information disclosure statement and cited references, is respectfully requested.

THE OBJECTION TO THE ABSTRACT SHOULD BE WITHDRAWN

The Examiner has objected to the abstract of the disclosure because it does not describe the claimed subject matters as claimed in claim 123. Applicants have provided a replacement abstract that describes the claimed subject matters. The proposed amendment does not introduce new matter. Approval and entry of the amendment is respectfully requested. Furthermore, withdrawal of the objection in view of the provision of the new abstract is respectfully requested.

THE OBJECTION TO THE SPECIFICATION SHOULD BE WITHDRAWN

The Examiner has objected to the specification under 37 CFR § 1.75(d)(1) and MPEP § 608.01(o) for failing to provide proper antecedent basis for certain claim limitations in claims 123, 126, and 136.

Applicants wish to respectfully point out that claims 123, 126 and 136 are fully supported by the specification as originally filed. The limitations found in claims 123, 126, and 136 are discussed throughout the specification. Applicants have provided the following table to point out the location of some instances where these claims are supported.

Claim	Objected Claim Limitation	Partial List of Support in Disclosure
123	The resonant control system is inductively coupled to the first qubit.	(Page 12, line 5) (Page 19, line 30) (Page 23, line 12) (Page 36, line 8) (Page 37, line 16) (Page 39, line 2)
126	The resonant control system comprises a Josephson junction and a bias current source that is connected in series with the Josephson junction.	(Page 13, line 25) (Page 23, line 30) (Page 24, line 10) (Page 25, line 6) (Page 28, line 18) (Page 34, line 6) (Page 34, line 19) (Page 40, line 4)
136	The resonant control system is inductively coupled to a plurality of qubits.	(Page 28, line 9)

With this amendment, Applicants propose to amend the application by adding the following paragraphs to the specification at page 12, line 12, just prior to section entitled "DETAILED DESCRIPTION":

> An embodiment of the present invention provides a method for entangling a quantum state of a qubit with a quantum state of a resonant control system. The method for entangling a quantum state comprises tuning a resonant control system, which is capacitively or inductively coupled to the first qubit, to a resonant frequency for a period of time. The resonant frequency corresponds to an energy difference between a first energy level and a second energy level of the qubit. The act of tuning entangles the quantum state of the qubit with the quantum state of the resonant control system.
>
> An embodiment of the present invention provides a method for entangling a quantum state of a qubit with a quantum state of a resonant control system, including a Josephson junction. In such an embodiment, the resonant control system includes a Josephson junction with a bias current source that is connected in series with the Josephson junction. The act of tuning comprises altering the magnitude of the bias current source.
>
> Another embodiment of the present invention provides a method for entangling a quantum state of a qubit, within a plurality of qubits, with a quantum state of a resonant control system. The method includes tuning a resonant control system, which is capacitively or inductively coupled to the

> qubit within the plurality of qubits, to a resonant frequency. The resonant frequency corresponds to an energy difference between a first energy level and a second energy level of the selected qubit within the plurality of qubits.

The proposed amendment to the specification finds clear support in claims 123, 126, and 136 of the pending application. Further, the terms have support in the locations of the specification cited in the table above. Thus, the amendment does not introduce new matter and approval and entry of the amendment is respectfully requested. Furthermore, withdrawal of the objection in view of the amendments to the specification and the remarks below is respectfully requested.

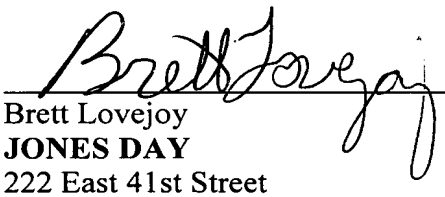
CONCLUSION

Applicants respectfully request that the above-mentioned amendments and remarks be entered and made of record in the file history of the subject application.

It is believed that no fees are due in connection with the filing of this amendment. However, should the Patent Office determine otherwise, please charge the required fee to Jones Day deposit account no. 50-3013, referencing CAM No. 706700-999185.

Respectfully submitted,

Date: October 12, 2004



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